Storage of Production Wastes

In the past, the South Chute Waste Pile received hazardous cell bath wastes contaminated with barium and sodium. It was constructed in 1981 to provide for accumulation of cell bath waste prior to disposal off site. The waste was allowed to remain there for three to five days until a full shipping load was accumulated. In 1994 the South Chute Waste Pile was closed under RCRA authorities.

The Waste Sodium Storage Area currently remains in operation. It stores drums of sodium/calcium sludge and other materials containing reactive sodium waste until they can be burned in the burning room.

Onsite Disposal of Production Wastes

Materials that have been disposed in waste piles and landfill areas at RMI Sodium include cell bath wastes, anode butts, salt dissolver sludge, and miscellaneous solid waste including electrolytic cell construction materials. The salt dissolver wastes were generated from crude salt dissolving operations and consisted of rocks, dirt, salt, and debris. The waste piles were eventually moved to onsite landfill areas and, in some places, covered. Onsite waste disposal areas that received the various wastes are described as follows:

Area A. The landfill (Area A) was active from 1950 to 1980 and received cell bath waste, anode butts, and a variety of solid waste, including construction debris.

The area of the landfill is approximately six acres. Fill material is estimated to extend to 15 feet below ground surface. RMI Sodium estimated the volume of waste in Area A as 83,000 cubic yards. RMI Sodium has reported to U.S. EPA that a two-foot clay cap was constructed over the landfill in 1981. No definitive records documenting the landfill cap construction (as-built drawings, field notes, etc.) have been found in U.S. EPA or Ohio Environmental Protection Agency (OEPA) files, nor provided by RMI Sodium. An April 19, 1988 record of a hearing before the Ohio Hazardous Waste Facility Board presents OEPA claims that they did not formally approve the closure of the landfill.

Combined Areas B & C. Waste piles that possibly contained cell bath wastes were located on the ground surface in Areas B and C, which adjoin each other. Wastes from these two areas were reportedly transferred to the Area A landfill in 1981 prior to landfill cover construction. Depth of contamination is believed to be less than six inches.

Area D. The segments that make up Area D are in the vicinity of what is now Area E (wastewater treatment ponds). When the wastewater ponds were constructed, approximately 6,500 cubic yards of excavated waste materials from Area D were disposed of at the fill area north of the ponds (Area G). Area D still contains an estimated 2,000 cubic yards of waste, mostly in the southernmost segment. This waste material could include cell bath waste, anode butts, construction debris, and Down's cell construction material.

Area F. It is believed that in 1966 and 1967 approximately 750 cubic yards of cell bath waste were placed in this low-lying fill area and covered. This area is now partially covered by an access road and a building.

Area G. Area G is the fill area north of the ponds. When the wastewater treatment ponds (Area E) were constructed, approximately 6,500 cubic yards of waste materials from Area D were excavated and disposed of at Area G. This material may have included cell bath waste, anode butts, construction debris, and Down's cell construction material.

Facility Regulation

RMI Sodium's current activities are regulated under four permits:

- An OEPA *RCRA Part B Permit*. This is an Installation and Operation Permit which regulates the storage and burning of reactive sodium waste. (Ohio ID No. 02-04-0584)

- An OEPA Air Permit which regulates the burning of the reactive sodium waste and the air emissions from the process. (Permit No. 0204010204 P007)

- An Ohio *National Pollutant Discharge Elimination System (NPDES)* Permit which regulates the liquid discharges from the wastewater treatment ponds. (Permit No. 3IE00012*DD)

- A U.S. EPA RCRA Part B Permit that regulates the storage and burning of reactive sodium waste and includes some regulatory aspects of the wastewater treatment ponds (Area E). (Permit No. OHD000810242)

  Also, the U.S. EPA RCRA Part B Permit includes corrective action provisions under which RMI Sodium has conducted a RCRA Facility Investigation (RFI), a Supplemental RFI, and a Corrective Measures Study (CMS). The following documents have been generated as a result of these requirements:

  - RCRA Facility Investigation (RFI) Work Plan (Approved March 1988);
  - RFI Report (May 1989; Revised June 1990);
  - Corrective Measures Study (CMS) - Partial Submittal (June 1990);
  - Supplemental Investigation Report (April 1991; Revised August 1991);
  - CMS Work Plan (May 1991; Revised August 1991, March 1993);
  - CMS Report (August 1991; Revised March 1993, September 1994, May 1995);

- Baseline Risk Assessment - Appended to the revised Final CMS Report (September 1994); and
- Work Plan for Further Investigation of the Area A landfill (May 1995).

ENVIRONMENTAL SETTING

Geology & Hydrogeology

RMI Sodium is located on the Lake Plain *physiographic* province, a belt about three to five miles wide and parallel to the Lake Erie shoreline. This province consists of a series of sandy and gravelly ridges representing beaches of earlier lakes. With the exception of the two most prominent ridges, the Lake Plain is relatively flat and poorly drained.

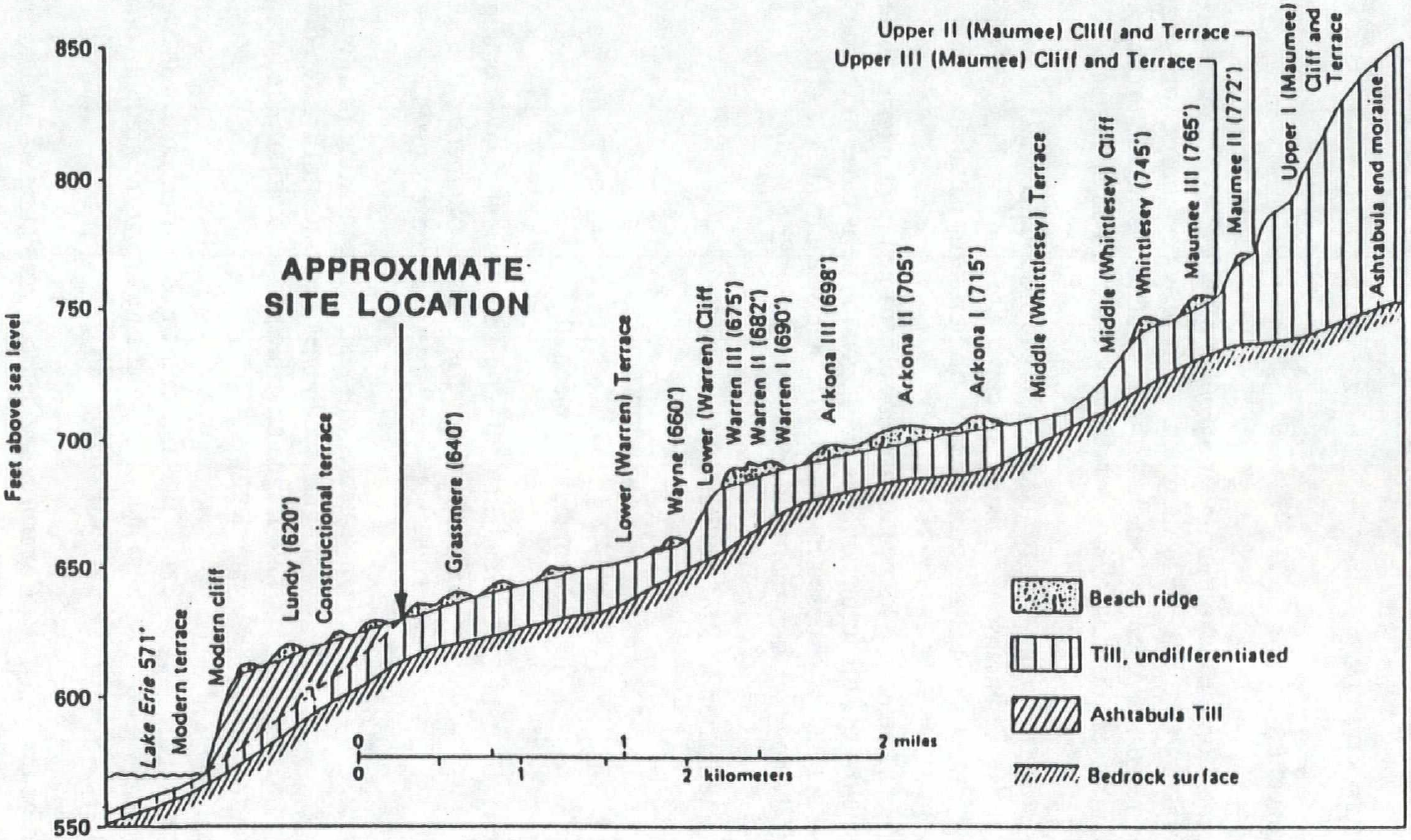
RMI Sodium and the surrounding area is underlain by unconsolidated glacial material, known as till. This till consists of an unsorted mixture of clay, silt, sand, pebbles, cobbles and boulders. Figure 4 shows a composite cross section of Northern Ashtabula County.

Hard consolidated rock, otherwise known as *bedrock* and named the Chagrin Shale, was identified directly below the till formation. The Chagrin Shale is close to the surface over much of the Lake Plain and is exposed in almost all of the stream valleys. The bedrock surface slopes slightly downward to the north toward the Lake Erie Basin.

The geologic characterization of RMI Sodium is as follows:

Depth	Description
• 0 to 7 feet:	Manmade fill material.
• 7 to 18 feet:	Weathered till, consisting of silty clay, containing traces of fractured or broken shale fragments, thin silt and fine sand layers and large oxidized fractures.
• 18 to 58 feet:	Unweathered till material, consisting of silty clay, containing sand zones and traces of fractured or broken shale fragments which increase in size and frequency with depth.
• 17 to 25 feet: (in vicinity of Area A only)	Sandy till zone composed of fine sand with varying amounts of silt and clay and form gradual contacts with the surrounding till.
• 58 feet and below:	Chagrin Shale bedrock consisting of hard consolidated, platy shale.

FILE NO. 155007-1.DWG



NOTE:

ELEVATION OF BEACH RIDGES ARE FOR THE WESTERN BORDER OF THE COUNTY; MANY ELEVATIONS RISE TO THE EAST.

SOURCE: WHITE AND TOTTEN, 1979

SCALE: NONE

RMI SODIUM
ASHTABULA, OHIO

COMPOSITE CROSS SECTION OF NORTHERN ASHTABULA COUNTY

FIGURE 4

Figures 5, 6, and 7 show cross sections of the site geology at RMI Sodium.

Groundwater beneath RMI Sodium occurs within two zones:

1. Shallow zone - This zone consists of two intervals: 1) An *unconfined water* table interval in the fill and upper weathered glacial till; and, 2) a semi-confined interval within the deeper, unweathered glacial till.

2. Deep (Bedrock) zone - A *confined water* bearing zone within the Chagrin Shale. The regional shallow *groundwater table* occurs at depths of two to ten feet below ground surface within the *lacustrine* and glacial till deposits of the Lake Plain belt. Groundwater movement on a regional basis is towards Lake Erie while at RMI Sodium it is generally toward rivers and tributaries.

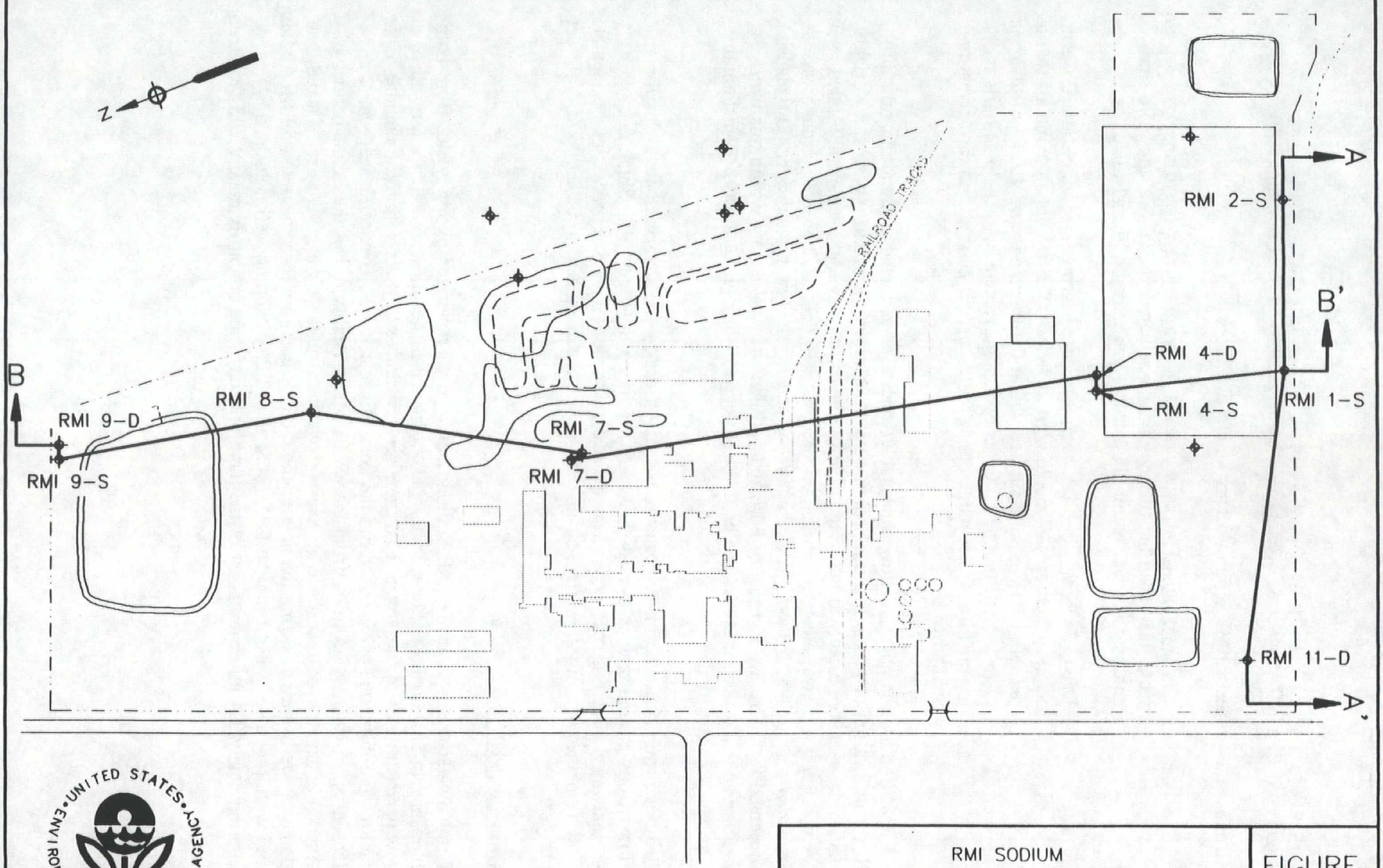
At RMI Sodium the upper shallow water table zone receives recharge predominantly through direct infiltration of precipitation. Groundwater flow direction within this zone is variable due to the recharge effects to the water table by the onsite clay and synthetically lined ponds (Ashco Reservoir, wastewater treatment ponds, etc.). In general, however, groundwater is *mounded* and radiates outward from the site. A general shallow groundwater flow map is presented in Figure 8. The rate of horizontal groundwater movement within this *water bearing zone* has been calculated to be 0.7 feet per year throughout most of RMI Sodium and 7.0 feet per year adjacent to the ponds.

Bedrock groundwater occurs under confined conditions in the Chagrin Shale. Horizontal flow of this groundwater is towards Lake Erie to the north (Figure 9). Slight deep groundwater mounding may occur near the eastern portion of the site. Average horizontal flow velocities within this water bearing zone have been calculated to be 0.006 to 0.18 feet per year.

Groundwater Use

Groundwater at and near the RMI Sodium facility is characterized by low yields from both the Chagrin Shale bedrock (deep zone) and the glacial till (shallow zone). As a result of the low permeabilities of these materials, there are few domestic wells within the vicinity of the facility and no municipal wells within the area. Except for the City of Orwell which is located approximately 15 miles from the RMI Sodium facility, all of the municipalities in Ashtabula County use Lake Erie or reservoir water for potable water supplies. Of the nine domestic wells located within the area of the facility, eight are located south of RMI Sodium and withdraw their water from the Chagrin Shale. The remaining well is located approximately 2.4 miles northeast of the plant boundary and is approximately 200 feet deep.

FILE NO. 155007-5A.DWG

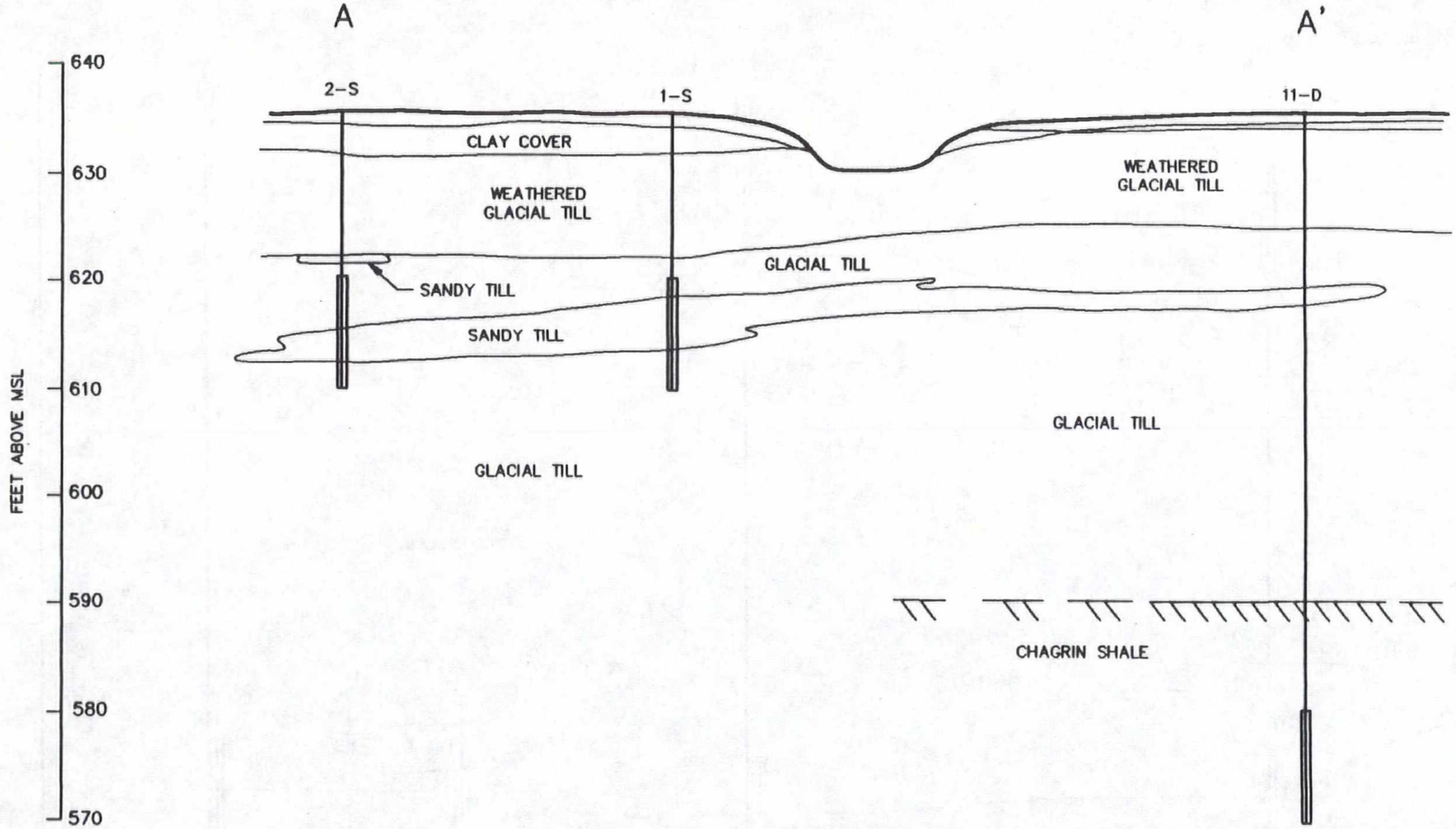


RMI SODIUM
ASHTABULA, OHIO

CROSS SECTION LOCATION PLAN

FIGURE 5

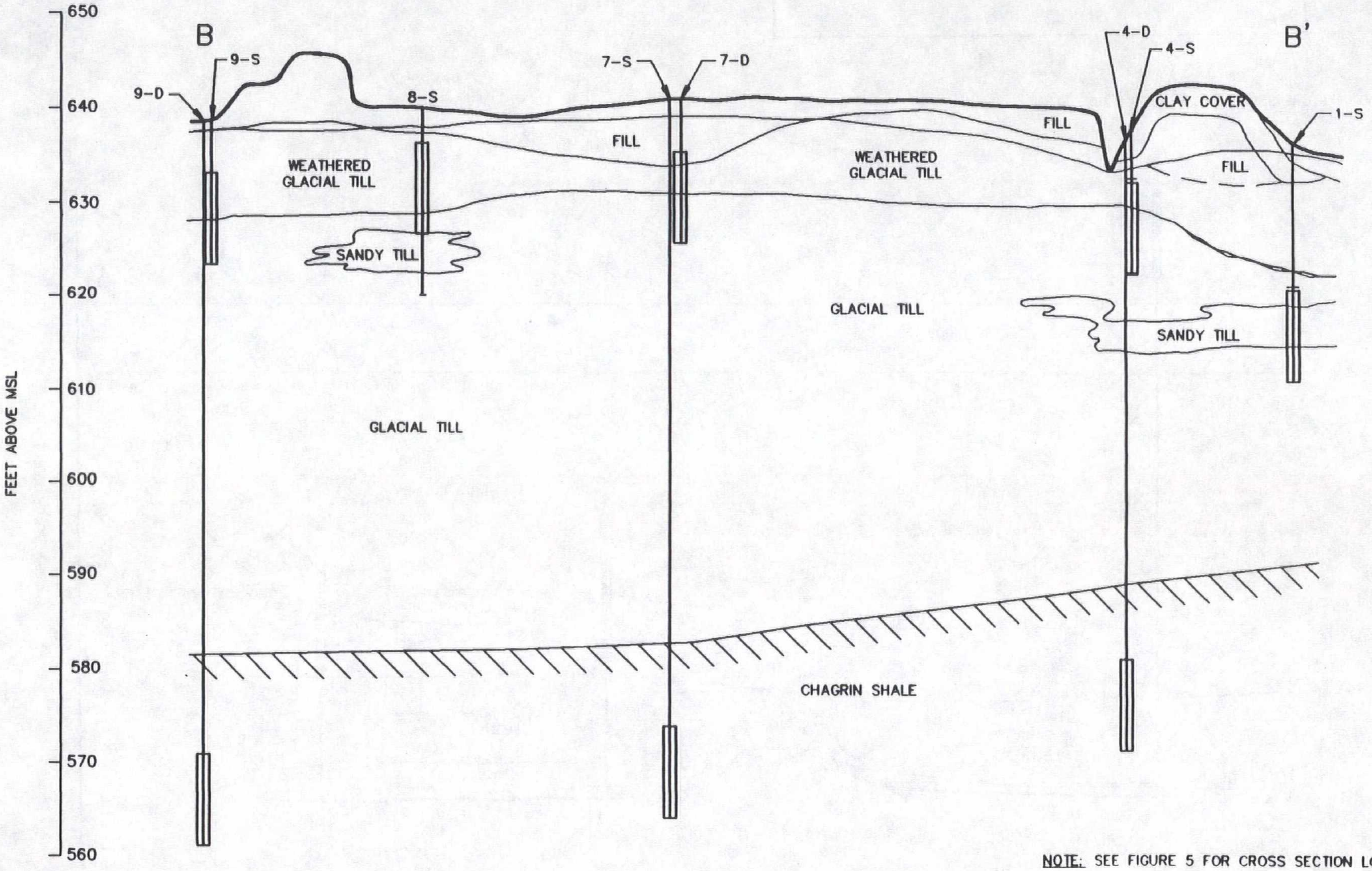
FILE NO. 155007-5.DWG



NOTE: SEE FIGURE 5 FOR CROSS SECTION LOCATION

RMI SODIUM ASHTABULA, OHIO CROSS SECTION A–A'	FIGURE 6

FILE NO. 155007-3.DWG



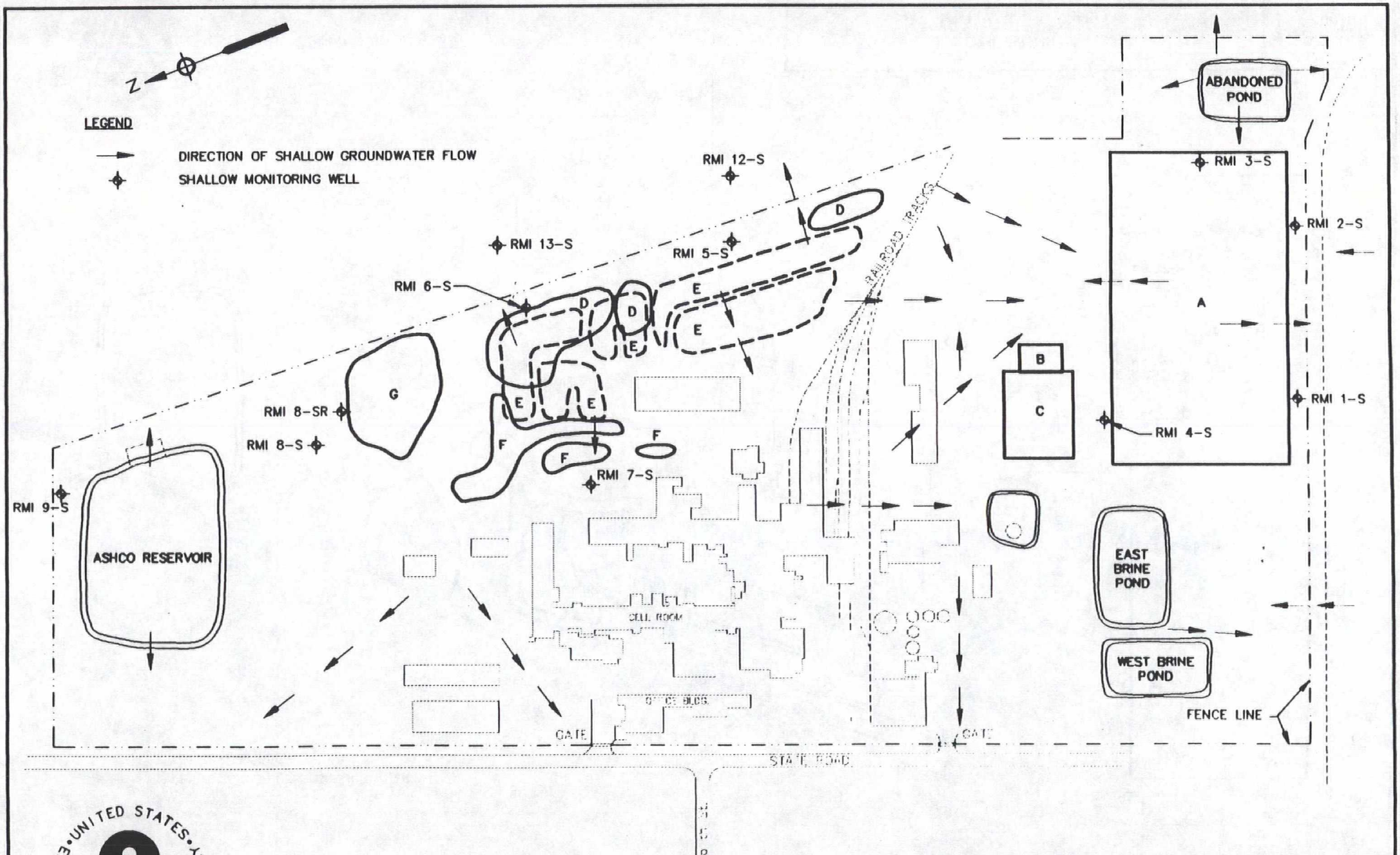
NOTE: SEE FIGURE 5 FOR CROSS SECTION LOCATION

RMI SODIUM
ASHTABULA, OHIO

CROSS SECTION
B–B'

FIGURE
7

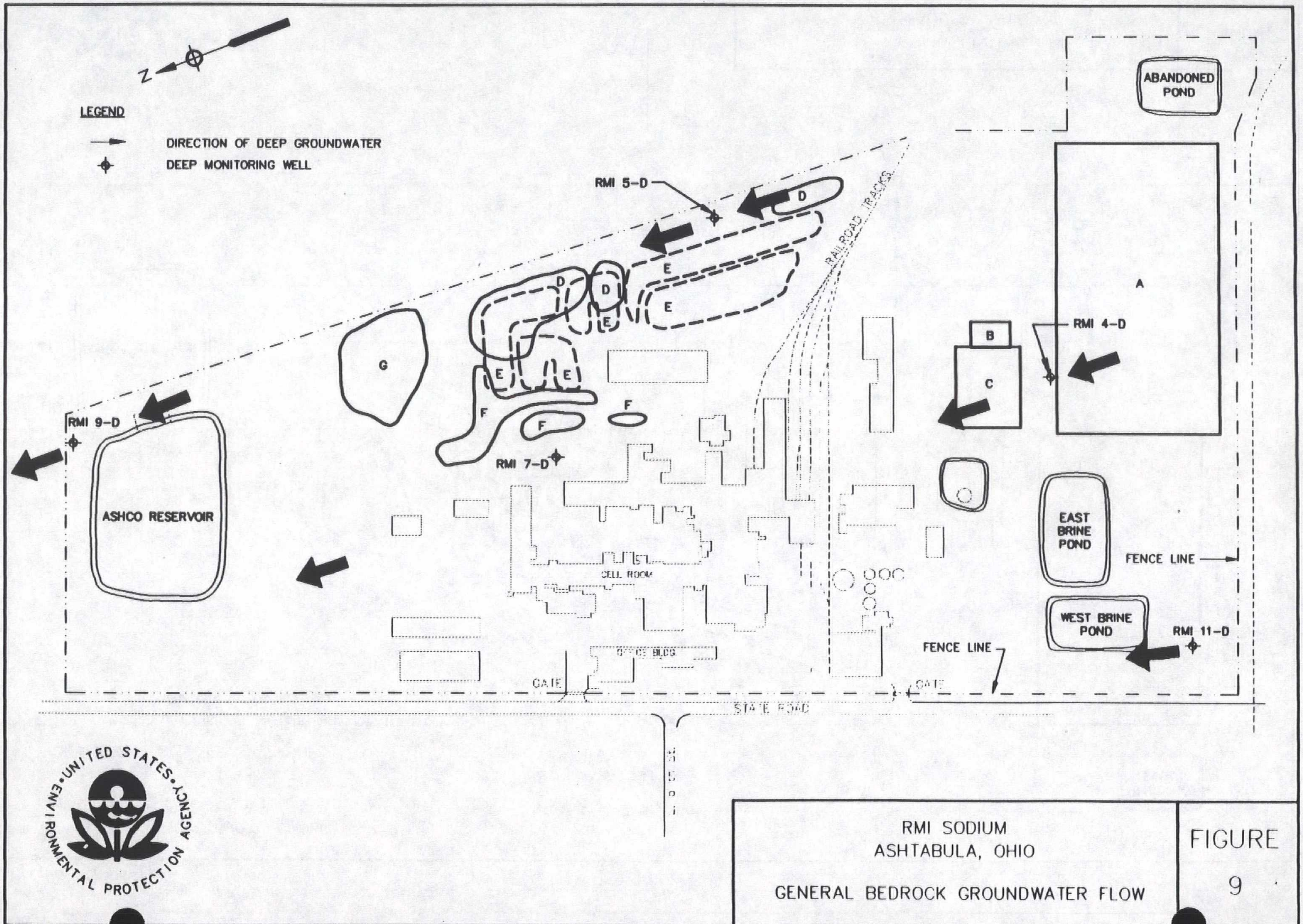
FILE NO. RCRA7.DWG



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RMI SODIUM ASHTABULA, OHIO GENERAL SHALLOW GROUNDWATER FLOW	FIGURE 8

FILE NO. RCRA6.DWG



RMI SODIUM
ASHTABULA, OHIO

GENERAL BEDROCK GROUNDWATER FLOW

FIGURE 9

Ecology

RMI Sodium consists primarily of buildings, process areas, regulated and unregulated areas, ponds and some open fields. Suitable wooded habitat for mammals, birds and other wildlife are not present on site. Rodents, transitory birds and various invertebrate species may be present on site but due to the absence of suitable habitats, the occurrence of large numbers of these species is unlikely. There are no federal endangered or threatened species, with the exception of Walnut Beach Park, nor federal lands managed for ecological value within a two mile radius of RMI Sodium. Similarly, there are no existing or proposed state nature preserves or scenic rivers within the surrounding area.

The one ecologically significant area, Walnut Beach Park, falls within a two mile radius of RMI Sodium. At Walnut Beach Park, there are four threatened species of plants. Previous investigations indicate that the threatened species are not at risk from site constituents.

PREVIOUS INVESTIGATIONS

The previous investigations performed at the RMI Sodium facility are identified as follows:

1. Surface Geophysical Survey - Results submitted to U.S. EPA in July, 1988.
2. RCRA Facility Investigation (RFI) - Revised report submitted to U.S. EPA in June, 1990.
3. Supplemental Investigation for the RCRA Facility Investigation - Revised report submitted to U.S. EPA in August, 1991.
4. RCRA Corrective Measures Study - Revised report submitted to U.S. EPA in May, 1995.
5. Further Investigation of Area A (Landfill) - Pending.

Summary of the RFI and Supplemental RFI

RMI Sodium's RFI was performed from March 1988 through June 1990. The purpose of conducting the RFI was to determine the nature and extent, if any, of releases from previous and existing SWMUs at RMI Sodium. The SWMUs investigated were as follows:

Area A:	Inactive landfill located at the south end of RMI Sodium
Combined Areas B & C:	Fill areas north of Area A
Area D:	Former fill areas in the vicinity of Area E
Area E:	Wastewater treatment ponds (Active)
Area F:	Fill areas west of Area E
Area G:	Fill area north of Area E

Investigations conducted during the RFI included 1) a surface geophysical investigation, 2) surficial soil sampling, 3) subsurface soil sampling, 4) groundwater flow data gathering, 5) water level measurements, 6) groundwater sampling, 7) surface water sampling, and 8) sediment sampling.

The supplemental RFI was performed to address gaps in the data identified during the initial RFI. Work included 1) defining the bedrock piezometric surface and direction of groundwater flow, 2) defining the hydrogeology and shallow groundwater, surface water, and sediment quality in the vicinity of RMI Sodium's eastern property boundary, 3) determining the potential for offsite contaminant release adjacent to the eastern boundary, and 4) defining sediment quality in an onsite ditch where erosion of soil or fill material had been documented.

Major Contaminants of Concern

Based upon the investigations performed, the major chemicals of concern were identified as:

Inorganic Chemicals

1. Barium
2. Cadmium
3. Lead
4. Arsenic

Organic Chemicals

1. Chlorinated solvents in the form of a *dense, non-aqueous phase liquid* (DNAPL). The source of the DNAPLs has been determined to be a chemical plant located adjacent to RMI Sodium's southern boundary.

Contaminated Media

As identified from onsite investigations, the following media are contaminated with various organic and inorganic constituents:

1. Surficial soil samples were found to contain arsenic, barium, cadmium and lead.

2. Subsurface soil samples were found to contain barium, cadmium and lead.

3. Surface water was found to contain barium and cadmium.

4. Groundwater was found to contain barium and cadmium.

5. Sediments were found to contain barium and cadmium.

The DNAPL contamination, found to originate from a neighboring chemical plant, was identified in a sand lens that occurs in the unweathered till and extends underneath the inactive landfill (Area A). This contamination is currently being addressed, under the *Superfund* program, by U.S. EPA, and by Detrex, Inc., operator of the neighboring plant and a member of the Fields Brook Superfund Site group of *Potentially Responsible Parties* (PRPs).

Extent of Contamination

The data obtained from media specific investigations are summarized in Table 2. The action levels shown were set by U.S. EPA during the RFI. The only exception is lead. The action level of 400 *parts per million (ppm)* that is shown in the table was set during the risk assessment. During the RFI, the action level for lead was 24.9 ppm.

The extent of contamination for each SWMU investigated during the RFI, and later addressed in the CMS, is shown below:

Area A:	DNAPL found 17 to 25 feet below ground surface.
Area B:	Cadmium, lead, and arsenic in surficial soils.
Area C:	Lead and arsenic in surficial soils.
Area D:	Lead in shallow soils 3 to 6.5 feet deep.
Area F:	Lead and arsenic in surficial soils.
Area G:	Arsenic and lead in surficial soils; cadmium and lead in soils 0.5 to 3.3 feet deep.

FACILITY RISKS

Baseline Exposure Scenarios

A *baseline risk assessment* was conducted for the RMI Sodium facility as part of the CMS. The current land use scenario was identified as industrial. The potential future land use scenario, determined by U.S. EPA, was identified as residential. In both scenarios, risks were calculated for carcinogens and noncarcinogens.

Carcinogens are substances that have been determined to cause cancer in animals and are either known or suspected to cause cancer in humans. Noncarcinogens are substances that have not been determined to cause cancer, but which produce toxic effects in humans or animals.

Table 2: SWMU Area Comparison for Constituents of Concern[a]

SWMU Area	Medium	Constituent(s) of Concern	Concentration Comparison		(Soils Only, Without Regard to Contributing Constituent)			
					Industrial Worker Population		Residential Adult Population	
			Observed Level[b]	Action level[b]	Carcinogenic Index	Hazard Index	Carcinogenic Index	Hazard Index
A	shallow soils	arsenic	14.6	12	n/a	n/a	n/a	n/a
	groundwater							
	(Well 3–S)	barium	1300 ppb	1000 ppb				
	(Well 4–D)	barium	8500 ppb	1000 ppb				
	surface water							
	air	n/a						
B	shallow soils	arsenic	18.4	12	1.60E–05	0.85	3.90E–05	1.7
		cadmium	199	40				
		lead	355	400				
	groundwater							
	surface water	cadmium	37.9 ppb	9.5 ppb				
	air	n/a						
C	shallow soils	arsenic	21.7	12	1.60E–05	0.08	3.90E–05	0.17
		lead	80.7	400				
	groundwater							
	surface water							
	air	n/a						
D	shallow soils	lead	37.4	29.9	n/a	n/a	n/a	n/a
	groundwater							
	(Well 6–S)	barium	1200 ppb	1000 ppb				
	surface water							
	air	n/a						
E	shallow soils				n/a	n/a	n/a	n/a
	groundwater							
	(Well 5–D)	barium	6200 ppb	1000 ppb				
	surface water[d]	barium	2128 ppb	1000 ppb				
	air	n/a						
F	shallow soils	arsenic	17.6	12	1.50E–05	0.077	3.70E–05	0.16
		lead	87.5	400				
	groundwater							
	surface water							
	air	n/a						
G	shallow soils			12	1.60E–05	0.26	3.90E–05	0.55
	(surface)	arsenic	18.5	12				
	(surface)	lead	29.1	400				
		lead	189.9	29.9				
		cadmium	85.2	40				
	groundwater							
	surface water							
	air	n/a						
Background[c]	shallow soils				1.20E–05	0.066	2.90E–05	0.13
	groundwater							
	(Well 11–D)	barium	5200 ppb	1000 ppb				
	surface water							
	air	n/a						

a –Reference: Final Corrective Measures Study, Eckenfelder Inc., Revised 5/95, unless otherwise noted.

b– Concentrations in ppm unless otherwise noted.

c– Not a SWMU area.

d– Obtained from Table 6–6, RFI, Eckenfelder Inc., 6/90.

Carcinogenic risk is measured by target risk level, or the increased probability that members of a population may develop cancer due to exposure to contaminated media in their environment. For example, an estimated risk level of 1×10^{-4} means one additional person out of ten thousand may develop cancer as a result of coming into contact with chemicals in the environment. U.S. EPA has established a target risk level range of 1×10^{-6} (one in one million) to 1×10^{-4} (one in ten thousand) for carcinogens. Estimated carcinogenic risks which fall within this range may be acceptable for some types of land uses. Noncarcinogenic hazard is measured by a hazard index. The hazard index compares the estimated intake of chemicals from environmental media, e.g. soil, to a reference dose which is believed to be without adverse effects. A hazard index greater than 1.0 is a cause for concern.
For the RMI Sodium site, it has been determined that the only complete pathway of exposure to people is through contact with soil contaminants. Exposure pathways include the skin (dermal), ingestion, and inhalation.

The constituents of concern from the contaminated soil which were considered in the risk assessment were arsenic and cadmium. Lead was not factored into the risk assessment equations due to the lack of a toxicity value for lead. U.S. EPA currently recognizes a screening level of 400 ppm for lead in soil for residential land use. Therefore, this level was used in the risk assessment to indicate protection from potential human exposure. Note that these constituents of concern were determined based upon risk. In other words, the constituents were found at concentrations potentially harmful to the environment and its inhabitants.

For the current land use scenario, the estimated carcinogenic risk was comparable for all of the SWMUs which were evaluated. The sites had an estimated risk level of 1.6×10^{-5} (Areas B, C, B and C combined, and G) except Area F, which had an estimated risk of 1.5×10^{-5}. This compares with an estimated background soil risk level of 1.2×10^{-5}.

Noncarcinogenic hazard indices were calculated for each constituent of concern, per SWMU. The hazard indices for both arsenic and cadmium were added together to estimate a cumulative hazard for each SWMU where both chemicals were found. For the current land use scenario, all areas, with the exception of an index value of 0.077 for Area F, had a hazard index of 0.85. The estimated background soil hazard index was 0.066.

For both carcinogenic and noncarcinogenic risk, the principle driving forces were from the dermal contact and incidental ingestion exposure routes; for noncarcinogenic risk, cadmium was the primary risk contributor.

For the future residential land use scenario, again, the estimated carcinogenic risk was comparable for all of the SWMUs which were evaluated. An estimated risk of 3.9×10^{-5} was associated with Areas B, C, B and C combined, and G. The estimated risk for Area F was 3.7×10^{-5}. This compares with an estimated background soil risk level of 2.9×10^{-5}.

For the future residential scenario noncarcinogenic hazard, Area B and Areas B and C combined had a hazard index of 1.70. The estimated hazard for Area F was 0.16. The estimated background soil hazard index was 0.13.

For both carcinogenic risk, and noncarcinogenic hazard, the primary contributor to risk and hazard were from dermal contact and incidental ingestion of soil. For noncarcinogenic hazard, cadmium was the primary risk contributor. These trends were valid at each of the SWMUs evaluated.

SCOPE OF CORRECTIVE ACTION

Scope of Problem

Through corrective action investigations and evaluation it has been determined that soils, at limited depths and containing constituents above action levels, are the primary concern at the RMI Sodium site.

Area A is an inactive landfill with potential hazard constituents barium, cadmium, and lead due to previous deposits of cell bath and anode butt waste. Though no hazardous substances have been detected above action levels at this SWMU, additional monitoring wells, and a RCRA-type landfill cap will be constructed to enhance monitoring capabilities of the area.

Because they join each other and contained similar wastes, Areas B and C are combined into a single corrective action area. These units contain arsenic and cadmium above action levels and lead approaching action levels in the surficial soil. Cadmium is above action levels in the surface water. The presence of elevated levels of cadmium in the surface water is most likely due to erosion of surficial soils into the drainage ditch near Area B.

Area G contains arsenic above its action level in the surficial soil, and cadmium in soil 0.5 to 3.3 feet below ground surface. This area also contains elevated concentrations of barium and cadmium in the shallow groundwater. These concentrations in the groundwater are believed to be due to recharge of the groundwater from the wastewater treatment ponds, and from the *leaching* of subsurface soils or buried waste.

Contaminants in the wastewater treatment ponds (located at Area E) will be addressed when the ponds undergo RCRA closure after waste treatment activities at the thermal oxidation unit have been completed. Based on the remedy proposed by U.S. EPA, Areas D and F will not be addressed under corrective action activities.

SUMMARY OF ALTERNATIVES

Following are brief descriptions of alternatives evaluated in the Corrective Measures Study (CMS) revised, May, 1995. Table 3 - Comparative Summary of Corrective Measure Alternatives presents a comparison of the alternatives presented in the CMS. The

TABLE 3

COMPARATIVE SUMMARY OF CORRECTIVE MEASURE ALTERNATIVES

RMI SODIUM FACILITY
ASHTABULA, OHIO

Comparative Criteria			
Long-Term Reliability and Effectiveness	Reduction of Constituent Mobility, Toxicity, or Volume	Short-Term Effectiveness	Implementability
Alternative 1 - No Further Action			
Baseline for comparison. Does not reduce any potential for exposure.	Baseline for comparison. Does not reduce any potential constituent mobility, toxicity, or volume.	Baseline for comparison. Human health and environmental impacts determined to not be concern outside industrial setting.	Baseline for comparison.
Alternative 2 - Limited Institutional Action			
Long-term reliability improved over No Further Action due to land use restrictions. Effectiveness is only minimally improved over No Further Action.	Does not reduce any potential constituent mobility, toxicity, or volume.	Minimally effective over the short-term by elimination of direct exposure pathway.	Easily implemented.
Alternative 3 - Source Containment			
Improved over Limited Institutional Action. No additional O&M required.	Constituent mobility due to erosive forces reduced over Limited Institutional Action in areas with surficial contamination. Does not address constituent toxicity or volume. Does not address constituent transport in sediment.	Effective for the protection of human health and the environment. Improved over Limited Institutional Action.	Implementability is greater for this option than for Alternatives 4 and 5 due to simplicity of action. Minimal implementation time.
Alternative 4A - Excavation of Areas B and C, D, F and G; Disposal at Area A			
Excavation and consolidation of constituent material at Area A is a more thorough, effective and safe response compared to Alternative 3B because all maintenance efforts for the useful life of the cap are focused on one area. Consolidation/onsite disposal is an improved land use/management scenario. Excavation of Area D is not necessary to meet the corrective action objectives. Only Area A requires land use restrictions.	Potential constituent mobility is reduced substantially over containment alternatives because excavated material is consolidated at Area A and all other SWMUs targeted for action are eliminated. Excavation of Area D does not significantly reduce constituent mobility over Alternatives 1, 2 and 3. Does not address constituent toxicity or volume.	Not substantially different from that of capping each individual area, but improved over Alternatives 1 and 2.	Standard materials, equipment and construction techniques are applicable and excavation depths are relatively shallow. However, implementability is more complex than containment due to excavation, backfill and placement requirements. Existing underground utilities may increase implementation difficulty over containment alternatives. Implementation time increased over containment alternative.

TABLE 3 (Continued)

COMPARATIVE SUMMARY OF CORRECTIVE MEASURE ALTERNATIVES

RMI SODIUM FACILITY
ASHTABULA, OHIO

Comparative Criteria			
Long-Term Reliability and Effectiveness	Reduction of Constituent Mobility, Toxicity, or Volume	Short-Term Effectiveness	Implementabililty
Alternative 4B - Excavation of Areas B and C, F and G; Disposal at Area A; No Further Action at Area D			
See Alternative 4A. No Further Action at D does not affect the overall effectiveness of the option. Requires land use restrictions at Area A.	See Alternative 4A, first paragraph. The risk of constituent mobility at Area D does not warrant corrective action because the constituent source zone is in shallow soil and virtually immobile. Does not address constituent toxicity or volume.	Comparable to Alternative 4A.	See Alternative 4A. Improved over Alternative 4A because deeper excavations at Area D are not a component of this alternative. Implementation time decreased from Alternative 4A.
Alternative 4C - Excavation of Areas B and C, F; Disposal at Area G; No Further Action at Area D			
Comparable to Alternatives 4A and 4B. No Further Action at D and soil placement at Area G do not lend to increased effectiveness over Alternative 4A or 4B. Placement at Area G increases number of areas to be maintained and to which deed restrictions would apply compared to Alternatives 4A and 4B.	See Alternative 4A, first paragraph. Constituent mobility is significantly reduced compared to containment alternatives because excavated material is consolidated at Area G and all other SWMUs targeted for action are eliminated. See Alternative 4B, second paragraph. Does not address constituent toxicity or volume.	Comparable to Alternative 4A.	See Alternative 4A. Lack of deep (1 to 6 foot) excavations in Areas D and G greatly improve implementability over previously examined alternatives. Also improved because surface area of Area G is smaller than that of A. Implementation time decreased from Alternative 4A.
Alternative 4D - Excavation of Area F; Disposal at Area G; Source Containment at Areas B and C, D			
Improved over Alternative 3. Excavation of Area F and placement at Area G provides for a more effective response due to improved land use/management. Land use restrictions required for all site areas, except Area F. Number of areas to be maintained and to which deed restrictions would apply is increased over Alternative 4.	Potential mobility of constituents is reduced as compared to Alternative 3 provided the integrity of the cover system is maintained on a long-term basis. Mobility reduction is comparable to Alternatives 4A, 4B, 4C and 5. Does not address constituent toxicity.	Improved over Alternative 3. Comparable to Alternative 4A.	More difficult than Alternative 3 due to the number of areas to cover. Will require more time for implementation than Alternatives 1, 2 and 3. Standard materials, equipment and construction techniques are applicable and excavation depths are relatively shallow.

TABLE 3 (Continued)

COMPARATIVE SUMMARY OF CORRECTIVE MEASURE ALTERNATIVES

RMI SODIUM FACILITY
ASHTABULA, OHIO

Long-Term Reliability and Effectiveness	Reduction of Constituent Mobility, Toxicity, or Volume	Short-Term Effectiveness	Implementabililty
Alternative 4E - Excavation of Areas B and C and G; Disposal at Area A; No Further Action at Areas D and F			
See Alternative 4A. No Further Action at D and F does not affect the overall effectiveness of the option. Requires land use restrictions at Area A.	See Alternative 4A, first paragraph. The risk of constituent mobility at Areas D and F does not warrant corrective action because the constituent source zone is in shallow soil and virtually immobile. Does not address constituent toxicity or volume.	Comparable to Alternative 4A.	See Alternative 4A. Improved over Alternative 4A because deeper excavations at Area D are not a component of this alternative. Implementation time decreased from Alternative 4A.
Alternative 5A - Excavation of Areas B and C, D, F and G; Offsite Disposal			
Potentially improved over other alternatives, because affected material is removed from the site areas. Some control lost by transferring material to offsite facility. Would still require onsite land use restrictions.	Constituent mobility is eliminated. However, material removal does not provide substantial reduction in constituent toxicity, mobility or volume over onsite disposal. Does not address constituent toxicity or volume.	Offsite disposal substantially increases potential for offsite exposure for the duration of implementation.	See Alternative 4A, first paragraph. Less complex than Alternative 4 because onsite placement and capping components are eliminated. Shorter implementation time as Alternative 4. May require further material characterization for offsite disposal. Contingent upon availability of landfill space
Alternative 5B - Excavation of Areas B and C and G; Offsite Disposal; No Further Action at Areas D and F			
See Alternative 5A.	See Alternative 5A. The risk of constituent mobility at Area D does not warrant corrective action because the constituent source zone is shallow soil and virtually immobile. Does not address constituent toxicity or volume.	See Alternative 5A.	See Alternative 4A, first paragraph. See Alternative 5A. Potential utility conflicts in Area D are eliminated. Slight decrease in implementation time from Alternative 5A.

comparative summary table is from the CMS report, with some modifications. It shows a detailed analysis for each alternative. The evaluation was performed based upon the following criteria:

- Long term reliability and effectiveness;
- Reduction of constituent mobility, toxicity, or volume;
- Short term effectiveness; and
- Implementibility.

The fifth criteria for analysis is cost. This comparison is shown using pie charts which are presented in Figure 10. The costs shown in the figures were adjusted from the values shown in the CMS. The CMS costs were presented in 1993 dollars; Figure 10 values were updated to 1996 dollars, assuming annual inflation of 4%. This inflation rate comes from the ENR Construction Index, a price measurement instrument similar to the Consumer Price Index (CPI), an index used by economists to indicate rising prices in consumer goods. The *present worth* of each alternative assumes a project life of 30 years, commencing in 1996, and an annual interest rate of 5%.

Description of Alternatives

Alternative 1: No Action

This Alternative would consist of no further action in the CMS areas. Current general site maintenance activities consisting of maintaining vegetation, stormwater management facilities, and site security measures would continue.

Alternative 2: Limited Institutional Action

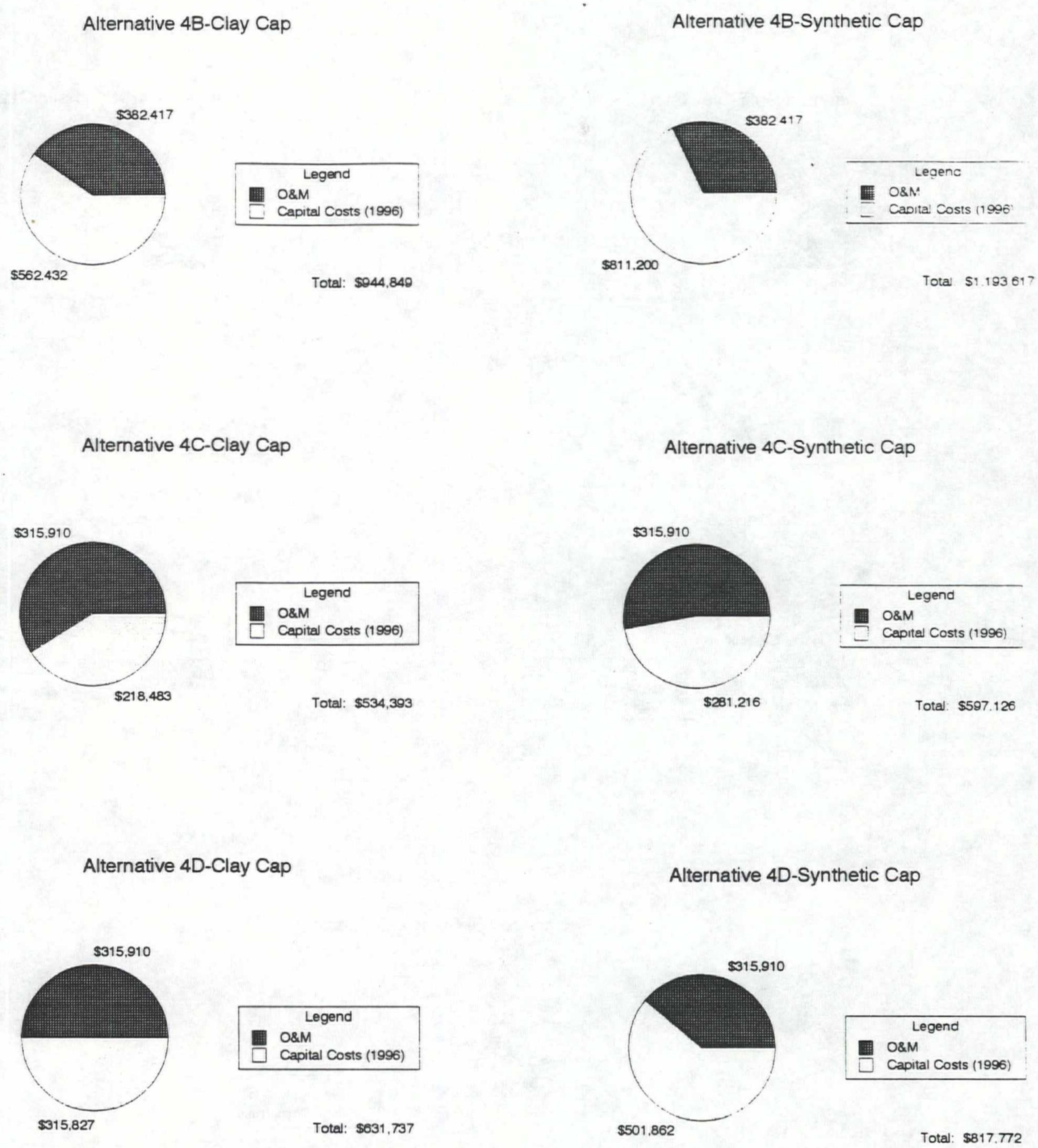
Alternative 2 would consist of continued site maintenance, combined with periodic groundwater monitoring and recording land use/deed restrictions on the property deed.

Alternative 3: Source Containment

Alternative 3 would consist of leaving existing topsoil and vegetative cover on Area A, and replacing or restoring topsoil cover and establishing vegetative growth at Areas B, C, D, F and G. Surface water drainage patterns would be modified during and after construction. Record development/use restrictions would be applied to the property deed. Site maintenance and groundwater monitoring would continue.

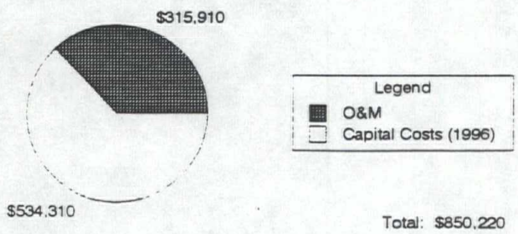
Alternative 4A: Excavation of Areas B, C, D, F and G; and Onsite Disposal at Area A

Implementation of this alternative would include modifying the surface water drainage patterns and providing erosion control during and after construction. The clean topsoil and vegetation from Area A would be stripped and stockpiled for reuse as a final vegetative

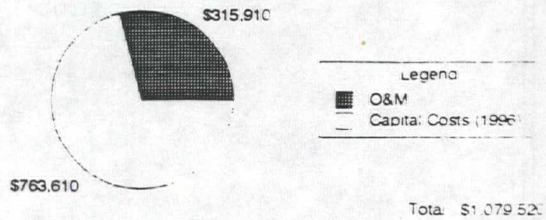


RMI SODIUM ASHTABULA, OHIO COST ANALYSES COMPARISONS OF THE CORRECTIVE MEASURE ALTERNATIVES	FIGURE 10

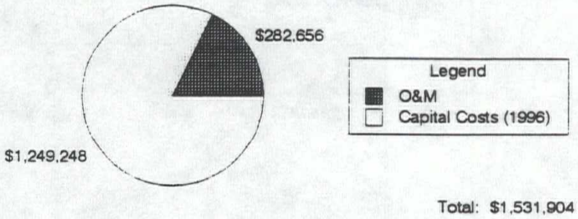
Alternative 4E-Clay Cap



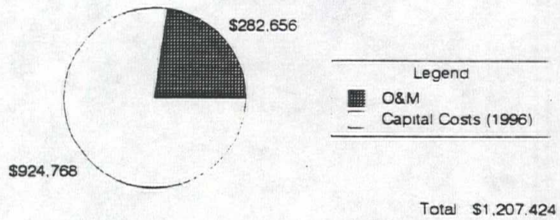
Alternative 4E-Synthetic Cap



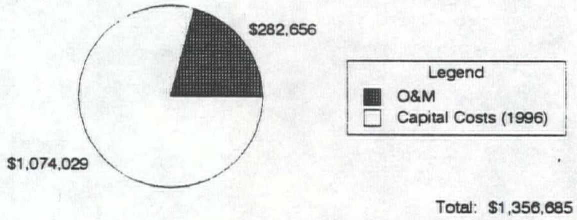
Alternative 5A



Alternative 5B



Proposed Remedy-Clay Cap



RMI SODIUM
ASHTABULA, OHIO

COST ANALYSES COMPARISONS OF THE CORRECTIVE MEASURE ALTERNATIVES (Cont'd.)

FIGURE 10

layer. Excavation would occur at Areas B, C, D, F and G and the ditch segment adjacent to Area B on the east. The material would be hauled onto the eastern half of Area A. Areas D and G would be backfilled, after excavating, with clean fill to within six inches of the surface. Either a clay cover system or a synthetic cover system would be installed over the excavated material. Vegetation would be established at Areas A, B, C, D, F and G. Record development/use restrictions would be applied to the property deed for Area A. Site maintenance and groundwater monitoring would continue.

The total estimated volume of material that would be excavated from site areas, and transported, is approximately 10,540 cubic yards (284,600 cubic feet).

Alternative 4B: Excavation of Areas B, C, F and G; Onsite Disposal at Area A; No Further Action at Area D

This alternative would consist of the same components and cap options as described above for Alternative 4A, with the exclusion of corrective action for Area D. The use of Area A would be restricted in the property deed.

Excavation activities would involve surficial excavation in Areas B, C and F, while Area G would be excavated to a depth of 3.5 feet. The estimated total volume of material that would be excavated and transported is approximately 8,600 cubic yards (231,715 cubic feet).

For this alternative it is assumed that the risk of constituent mobility at Area D does not warrant corrective action, because the constituent source zone is in shallow soil and virtually immobile.

Alternative 4C: Excavation of Areas B, C and F; Onsite Disposal at Area G; No Further Action at Areas A and D

This alternative would consist of leaving existing topsoil and vegetative cover on Area A. Areas B, C and F and the ditch segment adjacent to Area B on the east would be excavated and the material hauled to Area G for onsite disposal. This excavated material would be dewatered prior to placement in Area G. Areas B, C and F would be subsequently filled to grade, vegetated, and maintained as required. The excavated material would be spread evenly across the surface of Area G and a clay cover or synthetic cover capping system would be applied over the excavated material and vegetated. Record development/use restrictions would be added to the property deeds for Areas A and G. Site maintenance and groundwater monitoring would continue.

The total estimated volume of material that would be excavated and transported is approximately 2,100 cubic yards (56,715 cubic feet).

Alternative 4D: Excavation of Area F; Onsite Disposal at Area G; Containment at Areas B, C, D and G

Alternative 4D would leave the existing topsoil and vegetative cover on Area A. Area F and the ditch segment adjacent to Area B on the east would be excavated and the material hauled to Area G. The excavated material would be spread across Area G in uniform layers across the surface. Areas B, C, D and G would then be capped with a clay or synthetic cover system, and vegetation established. Area F would also undergo revegetation. The use of Areas A, B, C, D and G would be restricted in the property deed.

The total estimated volume of material that would be excavated and transported is approximately 743 cubic yards (20,061 cubic feet).

Alternative 4E: Excavation of Areas B, C and G; Onsite Disposal at Area A; No Further Action at Areas D and F

This is the alternative presented in the CMS by RMI Sodium as the preferred corrective measure remedy.

This alternative would have the same components and cap options described above for Alternative 4A, with the exclusion of corrective action at Areas D and F. Only the use of Area A would be restricted on the property deed for this Alternative.

The total estimated volume of material that would be excavated and transported is approximately 7,850 cubic yards (211,950 cubic feet).

Alternative 5A: Excavation of Areas B, C, D, F and G and Offsite Disposal

This alternative would consist of hauling excavated materials offsite to a permitted disposal facility. Area A would be left intact, the existing topsoil and vegetative cover undisturbed. Areas B, C, D, F, G, and the ditch segment adjacent to Area B on the east would be excavated, and the removed fill transported to a permitted offsite facility for disposal. The excavated areas would be backfilled and revegetated. Record development/use restrictions would be applied to the property deed for Area A. Site maintenance and groundwater monitoring would continue.

The estimated total volume of material that would be excavated and transported is approximately 10,540 cubic yards (284,600 cubic feet).

Alternative 5B: Excavation of Areas B, C and G; Offsite Disposal; No Further Action at Areas D and F

This Alternative is the same as described for Alternative 5A above, with the exception of Areas D and F. This alternative includes provisions of No Further Action at Areas D and F. The use of Area A would be restricted in the property deed.

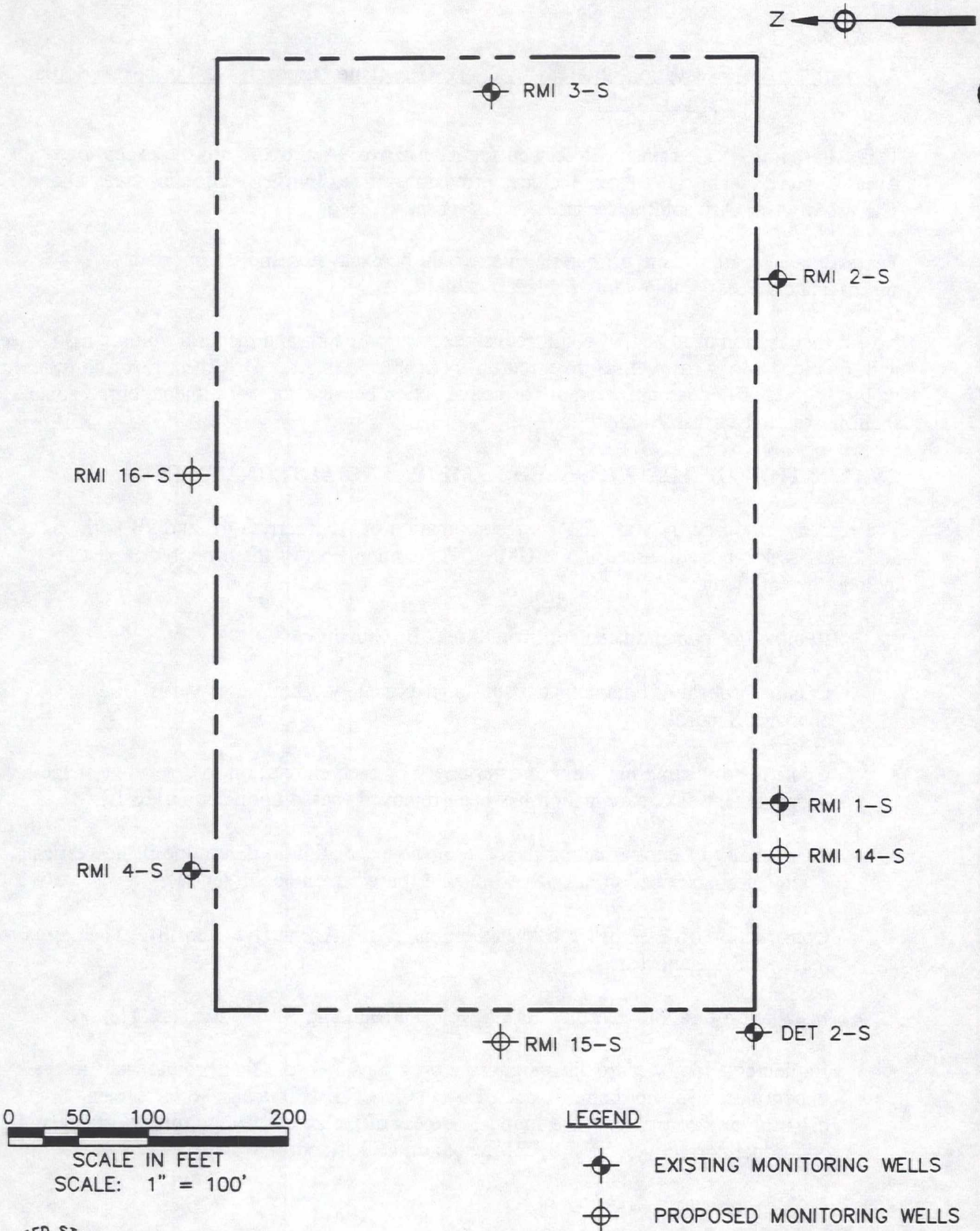
The estimated total volume of material that would be excavated and transported is approximately 7,850 cubic yards (211,950 cubic feet).

No Further Action at D and F would reduce excavation depth and disposal volume associated with this technology, as well as potential utility problems in Area D. The risk of constituent mobility at Area D does not warrant corrective action because the constituent source zone is shallow soil and virtually immobile.

EVALUATION OF THE PROPOSED REMEDY AND ALTERNATIVES

The remedy proposed by U.S. EPA is a combination of Alternatives 4E and 5B with additional action not addressed in the CMS. The components of the proposed remedy include the following:

- Removal of contaminated soil from Areas B, C and G;
- Offsite disposal of contaminated soil (approximately 7,850 cubic yards) at an approved landfill;
- Confirmatory sampling along the periphery of each excavation to determine if the lateral extent of contamination has been removed (based upon action levels);
- Confirmatory sampling along the base of the excavation to determine if the vertical extent of contamination has been removed (based upon action levels);
- Construction of a landfill cap over the entire Area A (inactive landfill). The cap is to meet RCRA standards;
- Installation of additional monitoring wells surrounding Area A (Figure 11);
- Implementation of a regular monitoring program to ensure that groundwater in the unconfined till is not being impacted by the landfill. If during the monitoring program any constituents are found in excess of the action levels, this will trigger additional corrective action by RMI Sodium at the landfill;



RMI SODIUM
ASHTABULA, OHIO

AREA A-INACTIVE LANDFILL
APPROXIMATE MONITORING
WELL LOCATIONS

FIGURE 11

FILE NO. 155007-2.DWG

FOUR GENERAL STANDARDS FOR CORRECTIVE MEASURES

Overall protection of human health and the environment

- How alternatives provide human health and environmental protection

Attain media cleanup standards

- Ability of alternatives to achieve the media cleanup standards prescribed in the permit modification or enforcement order

Control the sources of releases

- How alternatives reduce or eliminate to the maximum extent possible further releases

Comply with standards for management of wastes

- How alternatives assure that management of wastes during corrective measures is conducted in a protective manner

---

FIVE SELECTION DECISION FACTORS

Long-term reliability and effectiveness

- Magnitude of residual risk
- Adequacy and reliability of controls

Reduction of toxicity, mobility, or volume of wastes

- Treatment process used and materials treated
- Amount of hazardous materials destroyed or treated
- Degree of expected reductions in toxicity, mobility, or volume
- Degree to which treatment is irreversible
- Type and quantity of residuals remaining after treatment

Short-term effectiveness

- Protection of community during remedial actions
- Protection of workers during remedial actions
- Environmental impacts
- Time until remedial action objectives are achieved

Implementability

- Ability to construct and operate the technology
- Reliability of the technology
- Ease of undertaking additional corrective measures if necessary
- Ability to monitor effectiveness of remedy
- Coordination with other agencies
- Availability of offsite treatment, storage and disposal services and specialists
- Availability of prospective technologies

Cost

- Capital costs
- Operating and maintenance costs
- Present worth costs

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RMI SODIUM
ASHTABULA, OHIO

EVALUATION CRITERIA FOR CORRECTIVE MEASURES

FIGURE 12

- Application of land use restriction in the property deed for Area A; and

- No further action at Areas D and F.

Evaluation Criteria

The criteria used to evaluate the proposed remedy, as well as those detailed in the CMS, are shown in Figure 12. The criteria include the following four general standards for corrective measures:

- Overall protection of human health and the environment;

- Attain media cleanup standards;
- Control the sources of releases; and

- Comply with standards for management of wastes.

The five specific selection decision factors are as follows:

- Long-term reliability and effectiveness;

- Reduction of toxicity, mobility, or volume of wastes;

- Short-term effectiveness;

- Implementibility; and

- Cost.

Rationale for Selecting the Proposed Remedy

Discussion of SWMUs

A discussion of the rationale used to develop the proposed remedy is presented in the following paragraphs. This discussion begins with a description of how each SWMU will be affected by the proposed remedy.

In the RFI and CMS, Area A was disregarded by facility representatives as a SWMU which requires corrective action. RMI Sodium has repeatedly presented their case against corrective measures at Area A. U.S. EPA, however, disagrees with this position.

RMI Sodium has stated several times to U.S. EPA that the landfill was closed in 1980 by the OEPA. No record of this closure has been located. Additionally, an April 19, 1988 record of a hearing before the Ohio Hazardous Waste Facility Board presents OEPA claims that they did not formally approve the closure of the landfill.

RMI Sodium also contends that Area A was filled with process wastes that were tested and determined to be non-hazardous. There are no records (such as analytical results), however, that adequately characterize the wastes that have been placed in the landfill.

The following factors have caused U.S. EPA additional concern over eliminating Area A from corrective measures:

- The landfill has no liner underneath the waste;

- There is no leachate collection system;

- No borings were completed during the RFI characterizing the contents of the landfill;

- Surface soil samples obtained during the RFI were collected from the landfill cover. Arsenic was found in these soil samples at levels above U.S. EPA action levels, which indicates that the cover material was either not clean or had been eroded;

- Three rounds of groundwater monitoring have consistently indicated increasing barium concentrations in a monitoring well associated with Area A. Concentrations have increased from 910 *parts per billion (ppb)* in 1988, to 1,200 ppb in 1989 to 1,300 ppb in 1991. This trend may be indicative of a continuing release from Area A; and

- RMI Sodium reportedly added topsoil and reseeded the landfill cover in the past two or three years. However, during a trip to the site in July 1995, personnel representing U.S. EPA and the OEPA witnessed several bare spots on the cover where grass was not growing. This was especially evident on the sides of the landfill. Also witnessed on the surface of the landfill were areas that had a white residue, presumably salt. These observations provide doubt that a proper cover has been constructed on the landfill and lend evidence that there may be movement of constituents within and/or beneath the landfill.

Corrective action at Area A will include the construction of a RCRA-type cap over the landfill, and the implementation of a groundwater monitoring system to ensure that future releases will not occur.

Areas B and C are grouped together because they are located adjacent to each other and contain similar wastes. During the risk assessment it was determined that the noncarcinogenic index under the future residential scenario is 1.7. This level is greater than the level of 1, defined by U.S. EPA as the level indicating a need for concern. The estimated volume of soil to be removed is 1,357 cubic yards. This is based on an anticipated excavation depth of six inches. This also includes an estimated 100 cubic yards of sediment to be removed from a ditch immediately east of Area B.

Area D contains lead in shallow soils (3 to 6.5 feet). Area D, identified as three localized fill areas on Figure 3, is believed to have been used for the placement of wastes, including cell bath wastes. The southernmost segment of Area D is believed to be the only waste area of the original three that remains. This is due to the excavation of material from the two northernmost segments for the construction of the facility's wastewater treatment ponds (Area E).

Risks for lead were not quantified in RMI Sodium's risk assessment. However, the level of lead in Area D (37.4 ppm) is less than the CERCLA/RCRA lead screening level for residential soils (400 ppm).

Barium was found in the unconfined water bearing zone downgradient, at a level of 1200 ppb in well 6-S; this level is greater than U.S. EPA action level of 1000 ppb. It has been determined, for human health risk purposes, that groundwater is not a complete migration pathway, since drinking water for this facility would most likely come from Lake Erie.

Therefore, no further corrective action is necessary at Area D.

Area E, which consists of the wastewater treatment ponds, is currently in operation under a Federal RCRA Part B permit. At the time when the ponds are taken out of service, closure will be conducted under RCRA regulations and specifications. Any corrective action activities that are necessary will be conducted during closure.

Area F contains cell bath waste, anode butts, cell bricks, and construction debris. Constituents of concern identified in surficial soils were lead and arsenic. No further action is required at Area F because the residential carcinogenic risk level is 3.7×10^{-5}, the noncarcinogenic hazard index due to arsenic is 0.16, and the lead level of 87.5 ppm is well below the 400 ppm screening level.

Area G also contains cell bath waste, anode butts, cell bricks, and construction debris. Constituents of concerned identified in surficial soils were lead (29.1 ppm) and arsenic (18.5 ppm). Constituents of concern identified in shallow soils to an approximate depth of 3.3 feet were lead (189.9 ppm) and cadmium (85.2 ppm). The arsenic and cadmium levels are higher than action levels (Table 2).

The residential noncarcinogenic hazard level of 0.55 is below the limit of 1.0 and lead levels do not exceed 400 ppm. However, it has been decided that because lead, cadmium, and arsenic all exist in this area at moderate to significant levels, Area G will be subject to corrective action.

The estimated amount of contaminated soil to be removed from Area G is 6,482 cubic yards. The anticipated depth of excavation is 3.5 feet.

Discussion of selection criteria

Given the information just provided on each SWMU, the proposed remedy can be evaluated by the five selection criteria as discussed below.

Long-term reliability and effectiveness. Contaminated soils from Areas B, C and G will be completely removed from the site and disposed of in a regulated landfill. This will allow industrial and residential activities to be conducted on this site without health risks from current contamination.

Construction of a landfill cap over Area A that meets RCRA requirements, installation of additional monitoring wells, following a regular monitoring schedule, and writing deed restrictions for Area A will help ensure that there will be long-term protection from any future environmental problems caused by the landfill.

Reduction of toxicity, mobility or volume of wastes. No aspects of the proposed remedy will reduce the toxicity or volume of the contaminants. However, all aspects will reduce the mobility of constituents from Areas A, B, C and G. This will be accomplished because the contaminated materials will be confined in controlled landfills.

With contaminated soils removed from Area B, contamination of surface water in the drainage ditch nearby should cease.

No reduction of mobility will be experienced by the constituents of concern in Areas D, E and F.

Short-term effectiveness. Short-term effectiveness will be greatest at Area B where erosion of contaminated soil will cease.

Any potential risk at Area A will improve after the cap is placed on the landfill.

The highest short term risk will occur in the form of dust created by excavating contaminated soils, transfer of soil to trucks, transportation of soil, and dumping at an offsite landfill. Most risk will be experienced by remedial workers on site and at the offsite landfill. These risks should be reduced through the use of workers trained in the use of procedures for hazardous waste sites.

Implementibility. The proposed remedy is more complex than any of the previously mentioned alternatives because of the cap construction and the installation of monitoring wells. One advantage over Alternatives 4A through 4E (as presented in the CMS), is that the existing landfill topsoil will not have to be removed, piled and replaced. The new cap will be placed over the existing cover as long as proper compaction can be achieved.

The material being transported to an offsite landfill may require further material characterization.

Cost. As shown in Figure 10, the total cost of the proposed remedy is $1,356,685.00. This cost is greater than all the evaluated alternatives, with the exception of Alternative 5A. U.S. EPA's decision not to require a synthetic liner in the landfill (Area A) cap reduces the cost of the remedy if RMI Sodium chooses not to include a synthetic liner in the cap design.

PUBLIC PARTICIPATION

This Statement of Basis is a public participation document and it is hoped that the document will be widely read by those in the Ashtabula, Ohio area who may be affected by or are otherwise interested in the corrective action at RMI Sodium. The document describes the proposed remedy, but does not select the final remedy for the facility. The Statement of Basis allows the public, U.S. EPA and OEPA to consider additional information during the public comment period. Following this period, public comment and/or additional data may result in changes to the remedy or in another choice of remedy.

The final decision regarding the selected remedy will be documented in the final permit modification with the accompanying Response to Comments (RTC) after U.S. EPA and OEPA have taken into consideration all of the public's comments.

Public comment period

The comment period is from _______ to ___________. Please put any comments or suggestions in writing and send to the contact below or bring to the public meeting scheduled for _______, 1996 at _____________ in Ashtabula, Ohio. The meeting is scheduled to begin at 7:00 PM.

- **Provide the location of administrative record files and information repositories and times that the record is available for review (e.g., 9-5 weekdays, or only upon appointment).**

(TOM MATHESON TO COMPLETE)

Regulatory Contact

For more information, please contact:

Mr. Thomas W. Matheson
Waste Management Branch
U.S. Environmental Protection Agency, Region 5
DRP-8J
77 West Jackson Blvd.
Chicago, Illinois 60604-3590
(312) 886-7569

GLOSSARY

Baseline Risk Assessment - An evaluation of the existing conditions, with respect to the Corrective Measures. This evaluation considers the consequences if no further action is taken to remediate soil and groundwater contamination.

Bedrock - The solid rock that underlies gravel, soil or other superficial material.

Brine - A mixture of sodium chloride and water of which sodium chloride represents 5% or less of the solution's volume.

Confined Water - Groundwater that is located beneath a relatively impermeable soil or bedrock unit. The impermeable zone causes the groundwater to be isolated from the ground surface and the earth's atmosphere.

Corrective Measures Implementation (CMI) - The design, construction and operation of a clean up remedy at a site contaminated with hazardous waste and/or hazardous constituents.

Corrective Measures Study (CMS) - An evaluation of the alternatives for cleanup of sites contaminated with hazardous waste and/or hazardous constituents.

Dense Non-Aqueous Phase Liquid (DNAPL) - an organic chemical which is liquid at room temperature, is generally immiscible in water, and has a density greater than water.

Dredging - scooping or sucking up mud, sand and or rocks in order to enlarge or clean out a water source, e.g. ponds, rivers, etc.

Down's Cell - a container in which sodium metal and chlorine gas are produced, using an electrical current, which does not allow the formed products to touch one another and reform sodium chloride.

Facility - All contiguous land and structures, other appurtenances and improvements on the land under the owner or operator's control. This area shall include, but not be limited to, solid or hazardous waste management areas.

Groundwater - The water found beneath the earth's surface, in a saturated zone, that fills pores between materials such as sand, soil, gravel and cracks in bedrock.

Groundwater Table - The upper surface of the zone of subsurface saturation.

Hazardous Constituents - Those constituents listed in Appendix VIII to 40 C.F.R. Part 261 and Appendix IX to 40 C.F.R. Part 264.

Hazardous Waste - Waste as defined in Section 1004(5) of RCRA.

Inorganic - Chemical substances of mineral origin, not of basically carbon structure.

Lacustrine - Formed or found in lakes.

Leaching (-ate) - To extract by causing water to filter down through a material.

Monitoring Wells - A tube or pipe open to the atmosphere, and drilled at specific locations on or off a facility, where groundwater can be sampled at selected depths, and studied, to determine such things as the direction in which groundwater flows and the types and amounts of contaminants present.

Mound - An area where the groundwater table is at higher elevations than in surrounding areas, resulting in a groundwater "mound."

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under the Clean Water Act.

Organics - Compounds which contain carbon, for example methane (CH_4).

Parts Per Million (ppm) or Per Billion (ppb) - Units of measure, commonly used to express the concentration of contaminants, on a volume or mass basis.

$$\text{ppm} = \frac{\text{volume of contaminant} \times 10^6}{\text{volume of medium of concern (air or water)}}$$

$$\text{ppb} = \frac{\text{volume of contaminant} \times 10^9}{\text{volume of medium of concern (air or water)}}$$

Physiographic - A description of the earth's surface, oceans and the atmosphere.

Potentially Responsible Parties (PRPs) - Owners, operators, transporters generators, etc., associated with a Superfund site who may be liable for the costs of remediating the release of hazardous substances on the site.

Present Worth - The present day equivalent of payments made to another party in the future, based on a required or assumed interest rate. For example, when purchasing a car via a car loan, the financing source will charge the purchaser an interest rate over the term of the loan. The sum of the payments to the financing source are greater than the cost of the car. However, these payments are equivalent to the car's price, because they occur in the future and the financing source requires a return on their investment.

Resource Conservation and Recovery Act (RCRA) - This law authorizes a regulatory program for the treatment, storage and disposal of hazardous wastes. The law includes corrective action provisions that authorize the Federal government to respond directly to releases of hazardous waste which may be a threat, or potential threat, to public health and the environment. U.S. EPA is responsible for implementing RCRA corrective action activities in the State of Ohio.

RCRA Facility Investigation (RFI) - An investigation to determine the nature and extent of contamination at a facility and the problems that any determined contamination causes. The RFI is performed prior to a Corrective Measures Study, which identifies and analyzes cleanup alternatives for the site.

RCRA Part B Permit - RCRA Permit issued by State or Federal authorities that sets conditions for the treatment, storage or disposal of hazardous wastes.

RCRA Type Cap - A multi-layer RCRA Subtitle C waste cover which meets the technical requirements contained in the Code of Federal Regulations (CFR), Title 40, Part 264.310 and follows the guidance set forth in U.S. EPA document EPA/625/4-91/025 titled "Design of RCRA/CERCLA Final Covers". At a minimum, a RCRA cap consists of a vegetated top cover, a middle drainage layer, and a low permeability bottom layer constructed of a 2 feet or more clay cover and an optional 20 mil synthetic layer that may be optional.

Solid Waste Management Unit (SWMU) - Any unit at a facility which contains or contained solid or hazardous waste, from which hazardous waste or hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous wastes. A solid waste management unit may include areas at facilities which have become contaminated as a result of routine releases of hazardous waste or hazardous constituents. Examples of SWMUs include but are not limited to: landfills, surface impoundments, waste piles, land treatment units, incinerators, injection wells, tanks (including 90-day accumulation tanks), container storage areas, transfer stations, and waste recycling operations.

Statement of Basis (SB) - A public document that explains the Corrective Measures to be used at a RCRA Corrective Action Facility. The SB is based on information and technical analysis generated during the RFI/CMS.

Superfund - Common name for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. CERCLA gives the Federal government the power to respond to releases, or threatened releases, of any hazardous substance into the environment as well as to a release of a pollutant or contaminant that may present an imminent and substantial danger to public health or welfare.

Unconfined Water - A condition in which the water table is exposed to the atmosphere through openings in the overlying soil or bedrock.

Water Bearing Zone - A subsurface soil or bedrock unit capable of yielding water.

BIBLIOGRAPHY

RFI Report, Eckenfelder, Inc. for RMI Sodium, June, 1990.

Supplemental Investigation Report, Eckenfelder, Inc. for RMI Sodium, August, 1991.

CMS Report, Eckenfelder, Inc. for RMI Sodium, May, 1995.

Baseline Risk Assessment - Appended to the revised Final CMS Report, Eckenfelder, Inc. for RMI Sodium, September, 1994.

OEPA RCRA Part B Permit (Ohio ID# 02-04-0584).

NPDES Permit No. 31E00012*AD.

"Glacial Geology of Ashtabula County, Ohio", Report of Investigations No. 12, Ohio Division of Geological Survey, Columbus, Ohio; White, G.W. and S.M. Totten, 1979.

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 5
WASTE, PESTICIDE, AND TOXICS DIVISION
WASTE MANAGEMENT BRANCH
Review Comments on the DNAPL CONTINGENCY AND FIELD PLAN, DETREX FACILITY, ASHTABULA, OHIO, dated December 1995

The following are comments on the DNAPL CONTINGENCY AND FIELD PLAN DETREX FACILITY ASHTABULA, OHIO, dated December 1995, prepared for Detrex Corporation by Woodward-Clyde.

General Comment:

1. The northern extent of the DNAPL has not been adequately delineated by DETREX. Further, DETREX has not provided any plans to delineate the northern extent of the DNAPL. The closed landfill, in the southern portion of the RMI-Sodium property, is included in RMI-Sodium's corrective action program requirements, pursuant to its federal RCRA permit. The U.S. EPA is currently developing corrective measure alternatives for the closed landfill, under the RCRA program. The RCRA final corrective measure alternative will take into consideration the procedures DETREX employs in containing and remediating that portion of the DNAPL on RMI-Sodium property, particularly, that potion underlying the closed landfill.

   The DNAPL extends northward onto the RMI-Sodium property and may extend under the closed landfill on RMI-Sodium's southern boundary. Evidence that the DNAPL may extend under the closed landfill is described in the various documents, for example:

   > "Phase 1 Source Control Remedial Investigation Final Report", dated November 1995, on page 4.13-6, which states: "As described by Eckenfelder, 10 ft of dark red DNAPL was observed in the bottom of well 2S."
   >
   > According the 1989 RMI-Sodium RCRA Facility Investigation (RFI) Report: During the drilling of monitoring well 1S, high levels of volatile organic compounds (VOCs) were detected with an HNU photoionizer and droplets of DNAPL were recovered. VOCs were also detected in an HNU photoionizer during the drilling of piezometers PZ-8 (southern border of the closed landfill) and PZ-9 (center of the closed landfill).

> Further, in a September 1981 inspection of RMI-Sodium facility by the Ohio EPA, "...several pools of a dark red liquid..." were discovered in a ditch south of the closed landfill, in which chemical analysis indicated the presence of chlorinated organics.

These references strongly indicated the DNAPL underlies the closed landfill on the southern portion of the RMI-Sodium property. DETREX should include in its plans how DETREX will:

- delineate the northern extent of the DNAPL,
- will undertake actions to control and remediate the DNAPL underlying the closed landfill, and
- maintain the integrity of the closed landfill.

Specific Comments:

- Section 3.4, page D-112, item 5. The soil samples should be visually inspected by a geologist or hydrogeologist.
- Section 3.4, page D-113, item 2. The criteria that will be used to select soil samples, based on visual inspection, should be identified.
- Section 3.4, page D-113, item 3. According the DETREX, LNAPLs are not a potential concern, yet proposes to collect a soil sample "directly above the water table." DETREX should clarify its reasoning for collecting a soil sample directly above the water table, or propose to collect a sample at the bottom of the saturated zone of interest.
- Section 3.6, page D116, item 3. DETREX should identify the methods it will use for sampling the wells.
- Section 3.6.1, page D-117, paragraph 1. Hydraulic conductivity values frequently vary by more than two orders of magnitude within the same hydrogeologic unit, particularly when estimated by slug tests. DETREX should use a geometric mean of the hydraulic conductivity values to provide a more representative description of the average hydraulic conductivity.

- Section 3.6.1, page D-118, item 2. DETREX should define what detection limit it is using to determine the presence or absence of VOCs in identifying the type of casing to be used to case the well.

- Section 3.6.1, page D-118, item 4. DETREX should identify the source of the water it will use to hydrate the bentonite pellet seal and if the water was subjected to chemical analysis.

- Section 3.6.1, page D-119, item 5. DETREX should provide a minimum time for allowing the grout to settle, rather than "preferably overnight."

- Section 3.6.2, page D-120, item 2. DETREX should identify the criteria it will employ to determine the use of PVC or stainless steel casing.

- Section 3.6.2, page D-120, item 3. DETREX should identify the source of the water it will use in the drilling of the well.

RMI TITANIUM Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446-0269
FAX 216/544-7796

March 24, 1995

Adrienne LaFavre, Ph.D.
Environmental Specialist
Ohio EPA
Northeast District Office
2110 E. Aurora Road
Twinsburg, OH 44087-1969

Re: Transmittal of Supplemental RFI (August 1991)
RMI Titanium Company Sodium Plant
OHD 000 810 242

Dear Dr. LaFavre:

It has occurred to me that I forgot to include a copy of the August 1991 Supplemental Investigation Report for the RCRA Facility Investigation, RMI Sodium Plant, with my 3 March transmittal of the RFI Report. I apologize for this important omission. Here is a copy of the Supplemental RFI Report for your review.

As always, please call with any questions, 216/544-7688.

Sincerely,

Richard L. Mason
Director
Environmental Affairs

sim

enclosure

c (wo/e): T. Matheson, USEPA

RMI TITANIUM Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446-0269
FAX 216/544-7796

March 3, 1995

EXPRESS MAIL

Adrienne LaFavre Ph.D.
Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Re: Transfer of RMI Sodium Plant RFI, June 1990
OHD 000 810 242

Dear Dr. LaFavre:

Enclosed is a copy of the final RCRA Facility Investigation Report for the RMI Titanium Company Sodium Plant, Ashtabula, Ohio, June 1990, to facilitate your review of the Sodium Plant Corrective Measures Study. I am also enclosing for your information copies of three letters:

- a June 28, 1990 letter transferring two copies of this report to Ohio EPA,
- a May 18, 1990 letter transferring a copy of U.S.EPA's comments on the RFI, and confirming a meeting with Mark Bergman to discuss the RFI,
- a June 5, 1981 letter transferring a draft of the RFI to Ohio EPA.

RMI has attempted to keep Ohio EPA fully informed on the progress of this project. As always, you have my standing offer to meet with you at a time of your choosing in your offices to brief you on this or any related matter.

If you have any questions please call (216) 544-7688.

Sincerely,

Richard L. Mason
Director
Environmental Affairs

cc: T. Matheson - U.S.EPA

RMI TITANIUM Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446
FAX 216/544-7796

June 28, 1990

EXPRESS MAIL

Ohio EPA
Division of Solid and Hazardous
Waste Management
1800 WaterMark Drive
Columbus, Ohio 43266-0149

Re: RCRA Facility Investigation Report
RMI Sodium Plant
OHD 000 810 242

Dear Sirs:

Enclosed are two copies of the revised RCRA Facility Investigation Report (RFI) for the RMI Sodium Plant prepared by Eckenfelder, Inc. In a 9 May meeting with the U. S. EPA we agreed that, based on the U. S. EPA comments in this case, revising the RFI would provide a clearer and more convenient record than simply issuing an addendum. As we anticipated in the meeting, Eckenfelder was able to complete the revision expeditiously to avoid any delay of the ongoing project.

If you have any questions, please contact me at (216) 544-7688.

Sincerely,

R. L. Mason
Director
Environmental Affairs

Enclosures

cc: Mark Bergman, NEDO (w/o enclosure)

RMI TITANIUM

RMI Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446

May 18, 1990

Mr. Mark Bergman
Ohio Environmental Protection Agency
Division of Solid and Hazardous Waste Management
Northest District Office
2110 East Aurora Road
Twinsburg, OH 44087

Dear Mr. Bergman:

Enclosed is a copy of the U.S. EPA comments on the RMI Sodium Plant RCRA Facility Investigation Report. As I mentioned to you on the telephone, RMI met with U.S. EPA on May 9, 1990, to discuss the comments. I would like to review the U.S. EPA discussions with you in our May 23, 1990 meeting, 9:00 a.m., in your office.

As always, please call with any questions (216) 544-7688.

Sincerely,

Rick Mason

Richard L. Mason
Director
Environmental Affairs

RLM:pb

Enclosures

RMI TITANIUM

RMI Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446

June 5, 1989

Mr. D. F. Easterling
Environmental Scientist
Ohio EPA
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Dear Mr. Easterling:

Per our conversation today, please find enclosed one copy of the RMI Company Sodium Plant RCRA Facility Investigation Report (Vol. 1 and Vol. 2 - Appendices). I look forward to discussing this Report with you in the near future.

If you have questions or need additional information, please contact the writer.

Sincerely,

James M. Steudler

James M. Steudler

Enclosures

bc: W. J. McCarthy
J. F. Hornbostel, Jr.
M. C. Miller
B. A. DiRienzo

APR 28 1993

HRP-8J

Mr. Rob Lowry
Contractor Project Manager
Metcalf & Eddy
2800 Corporate Exchange Drive
Suite 250
Columbus, Ohio 43231

RE: RMI Sodium
RFI Work Assignment
Number R05019

Dear Mr. Lowry:

I have enclosed a copy of RMI Sodium's revised Corrective Measures Study (CMS) (Volumes 1 and 2), a copy of the revised Corrective Measures Study Plan, and a copy of the facility's response to U.S. EPA comments on the draft CMS report. These documents are dated as received by U.S. EPA on March 11, 1993.

In accordance with the TES work assignment No. R05019, Task 3.0, I am requesting a review and submittal of written comments on the enclosed documents. This review should be based on the U.S. EPA comments on the CMS, dated January 7, 1993 (enclosed). These comments were developed from previous reviews conducted by Metcalf and Eddy, as well as from an independent review conducted by U.S. EPA. Therefore, the purpose of the current review is to determine whether the latest submittals have adequately addressed the comments in the January 7, 1993 U.S. EPA letter.

According to the workplan, these comments are due within 30 days from receipt of this letter.

If you have any questions, please contact Harriet Croke at (312) 353-4789, as I will be taking another position within the U.S. EPA, effective May 3, 1993.

Thanks for all your good work on this project.

Sincerely,

Francine P. Norling
Environmental Scientist

Enclosure(s)

cc: Tom Lentzen, Metcalf and Eddy, TES X
Fred Norling, U.S. EPA
Harriet Croke, U.S. EPA

Metcalf & Eddy

September 3, 1991

RECEIVED
SEP 0 1991
OFFICE OF RCRA
Waste Management Division
U.S. EPA, REGION V

Ms. Francine Norling
U.S. EPA, Region V
230 South Dearborn
Chicago, IL 60604

RE: Review Comments, RMI Sodium
Revised Supplemental RFI Report
Work Assignment No. R05019

Dear Francine:

Enclosed are review comments on the Revised Supplemental RFI Report for the RMI Sodium facility in Ashtabula, Ohio.

If you have any questions about these comments, please call me at (614) 908-5501.

Sincerely,

Rob Lowry

Rob Lowry
Contractor Project Manager

RL:lap

cc: T. Lentzen - TES X
TES X Files

Recycled Paper

2800 Corporate Exchange Drive, Suite 250, Columbus, OH 43231
Telephone: 614 890-5501—FAX: 614 890-7421

Affiliates of Air & Water Technologies Corporation

ENVIRONMENTAL PROTECTION AGENCY
TECHNICAL ENFORCEMENT SUPPORT
AT
HAZARDOUS WASTE SITES

TES X

CONTRACT NO. 68-01-7351
WORK ASSIGNMENT NO. R05019

REVIEW COMMENTS
REVISED SUPPLEMENTAL RFI REPORT
RMI SODIUM
ASHTABULA, OHIO

U.S. EPA REGION V

METCALF & EDDY, INC.
PROJECT NO. 151019-0001-626

WORK PERFORMED BY:

METCALF & EDDY, INC.
2800 CORPORATE EXCHANGE DRIVE
SUITE 250
COLUMBUS, OHIO 43231

September 3, 1991